DANIEL BOONE NATIONAL FOREST

MONITORING AND EVALUATION REPORT

for

FISCAL YEAR 2004

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FOREST SUPERVISOR'S CERTIFICATION
DANIEL BOONE NATIONAL FOREST

I have evaluated the monitoring results and recommendations in this Report and have directed that the 2005 Action Plan be implemented according the the time frames indicated. Deviation from the Action Plan may occur if new information or changed resource conditions warrant otherwise. In giving this direction, I have considered budgeting requirements necessary to implement these actions.

As explained in the introduction to this document, the Land & Resource Management Plan for the Daniel Boone National Forest (Forest Plan) was revised in April 2004, which is mid-Fiscal Year (FY) 2004. The projects that were implemented during FY 2004 were planned in prior years under the 1985 Forest Plan as amended several times. Project plans being developed during this transition year were based on the direction being developed in the Revised Forest Plan; with the possibility that adjustments might be needed until the Plan was finalized. Monitoring of projects based on the 2004 Plan will begin to give an indication of the effectiveness of the Revised Forest Plan. The 2004 Revised Forest Plan is sufficient to guide management of the National Forest for implementation of projects during FY 2005.

Any amendments or revisions to the Forest Plan will be made using the appropriate National Environmental Policy Act procedures.

/s/George Bain 4/18/2006

GEORGE BAIN
Acting Forest Supervisor

Date

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EXECUTIVE SUMMARY

The findings of this Monitoring and Evaluation Report describe the trends and condition of the Daniel Boone National Forest's resources and programs. Based on these findings, recommendations have been made, and the 2005 Action Plan has been prepared (included at the end of this Report). The 2005 Action Plan includes actions from previous years that are incomplete. This process allows Forest managers to adapt to changing conditions, and help focus monitoring and evaluation for the coming year.

The following is a summary of monitoring findings, and noteworthy issues for fiscal year 2004:

Biological Diversity was monitored by evaluating management indicator species (MIS) and proposed, endangered, threatened, and sensitive (PETS) species. New MIS were assigned in the Revised Plan to help monitor a wider range of communities. Minimum management requirements were met during FY 2004. Five projects were implemented for the benefit of cavity dependent species. However, as a result of habitat loss due to the southern pine beetle outbreak, red-cockaded woodpeckers are no longer present on the Forest. Monitoring of aquatic species populations was lacking. Two species of plants were added to the Forest's PETS list in 2004.

Air Quality concerns on the Forest generally focus on fine particulates (PM2.5) and ozone. All monitors located within 50 kilometers of the Forest showed attainment of EPA standards. Mercury is an emerging issue that the Forest should track. There are no mercury monitoring sites on the Forest, but the Mercury Deposition Network estimates indicate fairly high deposition in eastern Kentucky. Kentucky has a statewide freshwater fish consumption advisory in effect.

Soil Productivity was monitored by evaluating soil disturbance at project locations. Standards for protecting and enhancing soil productivity have been effective. However, the issue still remains on how to determine the soil loss threshold necessary to maintain soil productivity.

A 5-year soil chemistry study concluded in 1999, conducted jointly by the University of Kentucky and the Forest indicates that incipient stages of acidification could be occurring in the most sensitive (low buffering) soils on the Forest. Results of almost 20 years of measurements at Grayson Lake State Park show that the pH of rainwater has increased from about 4.2 to 4.6.

Water Quality is monitored at various permanent stream locations. Comparison of 2004 habitat inventories to data collected in the 1990's suggests that over the past decade inventoried reaches have trended away from channels with deep small surface area pools, towards channels with shallow large surface area glides. This is a disturbing trend.

Progress has been made in closing and remediation of damage to soil and water resources from illegal off-highway vehicle use. Acid mine drainage from old mines remains problematic at several locations. However, in general, results from past water quality monitoring has shown that a vast majority of streams on National Forest land are of the highest quality and land management activities are not significantly degrading water quality.

Outdoor recreation opportunities were monitored by evaluating the condition of developed as well as dispersed areas. The facility condition rating for most recreation buildings is good; minor features such as picnic tables and grills are average. However, storms and lake action continue to deteriorate mooring sites and features at select sites such as Bee Rock Campground, and White Oak and Grove boat-in campgrounds.

The Forest completes a visitor use monitoring study for dispersed areas on a five year rotation. Since this did not occur in 2004, forestwide data specifically for 2004 is not available. Vistor use

with Red River Gorge & Cave Run Lake may be increasing. Field observations indicate that impacts are occurring in the Clifty Wilderness area.

Trails monitoring focused on determining the effectiveness of off-highway vehicle (OHV) trail standards, and general condition of trails. As a result of the beetle outbreak in 2000-2002, many dead pines are still standing along trails or have fallen across trails. Progress has been made in clearing these trails. Illegal user-developed trails are causing resource damage in many areas. Extensive horse use within the vicinity of Cave Run lake is degrading the condition of system trails and impacting other resources when illegal trails are created.

Roads were evaluated based on an evaluation of collector and local road construction and reconstruction. Road obliteration continues to be a priority, with targets being met that range from 1 to 3 miles each year. The Forest met road maintenance targets in 2004. The need exists to accelerate planning and implementation of projects that harden stream crossings and utilize more bottomless structures to enhance fish passage.

Pesticide Use is reported on the Annual Pesticide Use report. No pesticide was applied to the National Forest in 2004 for reforestation purposes. Household insecticide is occasionally used in and around developed sites.

Timber Production was evaluated based on allowable sale quantity and timber output projections made in the 1985 Forest Plan. Actual harvest (cut) for FY04 was 0.5 MMCF, or only about 4% of the Plan's harvest schedule. Most timber was sold as a result of hazard tree removal in recreation areas and along roads. Timber Stand Improvement during FY04 occurred on 3035 acres. The extensive natural conversion of pine and pine-hardwood types to hardwood as a result of the Southern Pine beetle outbreak in 2000-2001, has set back meeting of the Plan's objectives for forest types.

Mineral Production is evaluated by tracking the number of lease applications, timely processing, and number of exchanges of mineral ownership. Some applications were not processed in a timely manner. One coal lease application was completed for the Redbird District in FY04. No exchanges occurred during the year. Mitigation of geological projects on sensitive areas is determined by how well operators follow follow Forest Service guidance. The guidance offered to the operators was followed 90 – 95% of the time. Abandoned oil and gas activity areas that need improvement are on the districts that have limited staff to initiate remedies.

Land Purchace, Exchange, and Landline Maintenance is tracked through attainment reports. Considerably more than 10% of the Forest's property boundary lines are not meeting standard. Only 18 miles of the Plan objective of 450 miles/year was met in FY04. The Forest acquired 2533 acres through land purchace in FY2004; no land exchange activity occurred. Right-of-way acquisition was adequate to meet needs.

Special Use Management is monitored through inspections to determine if permit conditions are being met. The Forest was administering approximately 421 special use permits in FY2004, and had a target of 125 permit inspections for FY04. Only 26 of these inspections were accomplished.

Forest Health was evaluated based on three areas: air quality, fire management results, and insect & disease contitions. Where pine trees were killed by the southern pine beetle, inventory of damaged stands is an ongoing challenge, with an estimated 100,000 acres classified in the TRACS database as possibly needing reforestation due to pine mortality. Two-lined chestnut borer activity is occurring in many older white oak trees. Preparation for the gypsy moth and hemlock wooly adelgid was addressed in the Plan Revision.

Cultural Resource inventorys were ongoing throughout the year. Special emphasis was given to inventory and protection of archaeologically significant sites within the Red River Gorge Geological Area. Although law enforcement and public information has had positive results, damage to sites due to looting and recreation use continues to be a problem.

Fiscal Management results are summarized in Table D.1 for those topics considered in the 1985 Forest Plan. A comparison of Forest Plan projections with actual expenditures indicate that funding has not kept pace with estimated financial needs. The result is less service and fewer accomplishments than indicated from Forest Plan projections.

I. INTRODUCTION

The Land & Resource Management Plan for the Daniel Boone National Forest (Forest Plan) was revised in April 2004, which is mid-Fiscal Year (FY) 2004. However, the projects that were implemented during FY 2004 were planned in prior years under the 1985 Forest Plan as amended 14 times. Therefore, this Monitoring and Evaluation (M&E) Report is structured to correspond with the 1985 Forest Plan as amended. It is also structured to address the monitoring and evaluation requirements found in the National Forest Management Act (NFMA), and to be in compliance with the rules and regulations established in 36 CFR 219.12(k).

The purpose of this process is to document the results of the Forest Plan monitoring and evaluation for fiscal year 2004. Monitoring and evaluation of programs is done to determine the progress toward achieving management goals, objectives and applying standards and guidelines (S&G) of the Forest Plan. These findings led to the development of the 2005 Action Plan (included at the end of this Report). This process allows management of the Forest to adapt to changing conditions, and help focus monitoring and evaluation for the coming year.

Monitoring and evaluation is an ongoing process. It is documented through annual reviews made by the Forest Supervisor, Forest Staff Officers, District Rangers, and other Forest personnel. Information from these reviews is compiled into a comprehensive report after the fiscal year is completed. Monitoring indicates whether the management direction contained in the Forest Plan is being effectively carried out, and if any modification in direction is needed. It also indicates if the effects of implementing the Plan are occurring as predicted; whether the application of management area prescriptions are responding to current issues and concerns. Over the years, points of contention on how the Forest should be managed have come and gone. This report has a section that identifies new information and issues that may not have been addressed by the Forest Plan.

Organization of Sections II and III of this Report

Section II of this report (RESULTS AND FINDINGS) is formatted similarly to specific monitoring requirements which are listed in the Forest Plan Table VI-1 on pages VI-4 through VI-15 ("intent" column); Forest Plan amendment 10 (OHV) Appendix E-3; and Forest Plan Amendment 11 (SHNS) Appendix D. Section II contains the following information:

Monitoring Item Description – includes the method used for monitoring and its objectives.

Variability which would initiate future action – includes the acceptable tolerance levels.

Findings – a discussion of actions taken and changes in the resource.

Recommendations - possible recommendations include: 1) no action is needed; 2) continue Forest Plan implementation and monitoring; 3) amend the Forest Plan to clarify, change, or improve resource management; 4) further study to determine the best action to take; 5) elimination of current monitoring item; or 6) inclusion of new items.

Section III of this report (2005 ACTION PLAN) summarizes recommendations from section II, and contains the following information:

Action Needed - summary of one or more recommendations.

Responsibility - the person or position responsible for this action.

Projected Completion Date - anticipated completion date of the action.

II. RESULTS AND FINDINGS

A. Ecosystem Condition and Sustainability

1. Biological Diversity

A.1.a Wildlife and fish related standards and guidelines - Ensure that management standards and guidelines are properly applied for maintaining viable populations and diversity of plant and animal communities. Monitoring is done through compartment prescriptions and sale review, CISC inventory data, and water quality data.

Variability which would initiate future action: Significant deviation from management standards and guidelines.

A.1.a.1 Minimum management requirements (MMRs) (FLMP p. IV-9,10) - MMRs are applied through interdisciplinary project level planning to ensure age class dispersal essential to support viable plant and animal populations and biotic diversity. Application is based on 640-acre Wildlife Habitat Units (WHU) and is most effectively applied as a percentage of total forested acres within a management compartment.

Findings: MMRs were met during FY 2004. The minimum 6.3% early seral habitat MMR was met through damage to pine forests rather than timber harvest in general forest areas. The 3.2% over-mature forest MMR was meet. The 5.6% mast producing stands MMR was meet. The MMR for 3 snags per acre in 0-10 year old stands was also meet.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.a.2 Snags and den development (FLMP p. IV-9) - Planned for in conjunction with the project prescription process. Assistance trips and interdisciplinary reviews provide the monitoring.

Findings: Five projects (46 acres) were planned and implemented for the benefit of cavity dependent species. Follow-up assistance trips and interdisciplinary reviews were not conducted.

Recommendations: The findings in this M&E report are addressed in the Revised Forest Plan and supporting documents (signed April 2004).

A.1.a.3 Population objectives for Demand species (FLMP p. IV-13) - Habitat conditions are monitored using the CISC database. Population monitoring is accomplished cooperatively with the KDFWR using various census techniques and harvest data.

Findings: The 6.3% early seral habitat MMR was established in large part to provide habitat for demand species, in particular white tailed deer and ruffed grouse. In part the result of the pine beetle epidemic, approximately 50,000 acres of early seral habitat was available for these species. To meet the MMR, approximately 37,000 acres are needed. This habitat is not well distributed on the forest, but is present nonetheless. Over-mature forest habitat was provided. To meet the MMR, approximately 20,000 acres is needed. Over 80,000 acres is available. The mast producing habitat MMR was established to provide for squirrel, white tailed deer, turkey and other hard mast consumers. To meet the MMR, approximately 33,000 acres is needed. Approximately 200,000 acres was available. Where harvests occurred, at least 3 snags per acre were left. In pine beetle-damaged areas, as many as 30-40 large snags (≥9" dbh) per acre were available.

Deer harvest numbers have not been analyzed thoroughly since 2001. At that time harvest trends, the state's measure of population numbers, had consistently increased from 1985 on the forest, as well as

across the state, and were expected to continue to do so. Trends for squirrel populations as of 2000 indicate a relatively stable population across the state including the National Forest.

Recommendations: The findings in this M&E report are addressed in the Revised Forest Plan and supporting documents (signed April 2004).

A.1.a.4 Wildlife openings - established and maintained (FLMP p. IV-14,15) - The 1985 Plan's objective for establishing new permanent wildlife openings is 100 acres per year and average annual maintenance of 1,500 acres (FLMP IV-56).

Findings: No new wildlife openings were established. Eight projects were implemented to maintain 11,180 acres of opening habitat.

Recommendations: The findings in this M&E report are addressed in the Revised Forest Plan and supporting documents (signed April 2004).

A.1.a.5 Available water source (FLMP IV-15) - Identified in the prescription process and in support of program initiatives.

Findings: Eight projects were implemented establishing water sources which, in turn, improved 1,063 acres habitat.

Recommendations: The findings in this M&E report are addressed in the Revised Forest Plan and supporting documents (signed April 2004).

A.1.a.6 Cliffline Protection Zones (SHNS Appendix D, p. 5&6) – Annually, on one project per district where cliff buffers were employed, evaluate habitat conditions.

Findings: No cliff buffers were evaluated for habitat conditions during FY 2004.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.b Management indicator species (MIS)

A.1.b.1 Aquatic non-game MIS - Six stream fish species (blackside dace, arrow darter, fantail darter, rainbow darter, brindled madtom, and stoneroller) are identified to represent aquatic ecosystem conditions, and ensure that viable populations of all stream fish are maintained on the Forest.

Variability which would initiate future action: Significant reduction of species occurrence or habitat quality.

Findings: In 2000 a MIS report was written stating that collections of fish on the Daniel Boone National Forest by Forest Service personnel and other federal agencies, state agencies, and universities had been reviewed. It was found that all of the occasions that fish had been collected had not been frequent enough nor by the same methodology and the data was not able to be compared via population or habitat.

Two projects were undertaken during FY2004. The first one was to repeat a survey of streams that occurred about ten years prior, using the same techniques. Approximately ten streams were resurveyed and resulted in the finding that fish populations, overall, had stayed relatively the same. Several streams had populations that decreased in numbers and species while others increased in numbers and species. Several streams had populations that stayed basically the same. Once again, no real conclusions could be reached, however tentatively one could say that the overall populations stayed the same.

The second project was a blackside dace stream "blitz" where several different agencies participated in surveying designated streams within the Rock Creek water basin. Two streams were found to be harboring previously unknown populations of blackside dace. This further substantiates that blackside

dace were in the drainage naturally, rather than being bait bucket introduced. Genetic studies are needed to further substantiate this hypothesis.

The intense fish sampling regimes that are needed require a large trained workforce, and the overall high cost of each project is seldom funded. In addition, there is the scientific feeling that by the time fish species change enough in the creeks to be able to tell a problem is occurring, it is too late to do something about the problem.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004). Aquatic insects are felt to be better, easier, less costly and faster indicators of the condition of the streams and therefore were recommended to be used in place of or in addition to the fish surveys for monitoring the quality of the Forest's streams.

A.1.b.2 Smallmouth bass MIS - This indicator was selected to determine output levels in comparison to the Forest Plan projections, and assure maintenance of viable populations of existing vertebrates.

Variability which would initiate future action: Significant decrease in fish populations or habitat from previoulsy reported levels, for individual populations.

Findings: Approximately ten streams were resurveyed and resulted in the finding that fish populations, overall, had stayed relatively the same. Several streams had decreased in numbers and species while others increased in numbers and species. Several streams stayed basically the same. While not specifically designed to be looking for small mouth bass this project looked at all species and accordingly rated as to the previous species collected.

Fish sampling is often ineffective because of intense sampling regimes that are necessary, the man power needed, and the overall high cost of each project. In addition, scientific feeling is that by the time fish species change enough in the creeks to be able to tell a problem is occurring, it is too late to do something about the problem. Aquatic insects were felt to be better, easier, less costly and faster indicators of the condition of the streams and therefore were recommended to be used in place of or in addition to the fish surveys for monitoring the quality of the Forest's streams.

Recommendations: During FY 2004 the forest plan was in revision. The findings in this M&E report are addressed in the Revised Plan documents (signed April 2004) and supporting documents.

A.1.b.3 White-tail deer MIS - Selection was made to monitor this high demand species in comparison to Forest Plan output projections and assure viability of associates.

Variability which would initiate future action: A trend representing a significant population decline or unexplained difference in State population estimates vs. habitat trends.

Findings: Although population estimates were not obtained in 2004, trend data from 1980-2000 indicate the deer herd is healthy and growing, within the carrying capacity of the land, and well above levels where viability would be a concern. Habitat trends vs. population trends were last analysized in 2001. At that time harvest trends, the state's measure of population numbers, had consistently increased from 1985 on the forest, as well as across the state, and were expected to continue to do so. During the same period of time, timber harvest slowly declined from a high of 6,000 acres to a low of 0 acres. The resultant 0-10 year old forest habitat slowly declined from a high of about 6,000 acres to a low a few hundred acres. What caused this counter intuitive trend in the deer population on the forest is not known. It may be tied to a slight increase over the same period of acres of mast producing forest. It may also be tied to an increase in prescribed burning during the same period.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.b.4 Rufous-sided towhee and eastern bluebird - These two species were selected to represent early forest seral stages to ensure viability of associated and dependent native vertebrates.

Variability which would initiate future action: Significant deviation of habitat levels from Plan projections or population levels near minimum viable levels.

Findings: The last detailed look at trends for these species occurred in 2001. The Regional office proposed a region wide analysis of bird and habitat data for FY 2005. Through about 1999, the amount of early seral habitat decreased on the forest. Beginning around 1999 and continuing into 2001, the amount of early seral habitat increased on the forest, a result of the large pine mortality following the southern pine beetle epidemic.

Through 2000, Kentucky regional data from the breeding bird survey indicate a decrease in populations of rufous-sided towhee (now called eastern towhee), and an increase in the populations of eastern bluebirds. On the forest through 2000, breeding bird data indicate a decrease in eastern towhees and a decrease in eastern bluebirds. On the forest through 2000, point count data indicate an increase in eastern towhees and a sporatic presence in eastern bluebirds. Overall data from forest point count data through 2004 indicate a decrease in eastern towhees on the forest, and a sporadic presence in eastern bluebirds.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.b.5 Pileated Woodpecker MIS - The pileated woodpecker represents the old-age, large-tree component of the Forest, assuring suitable habitat to maintain viable populations of associated species.

Variability which would initiate future action: Significant deviation of habitat trends from Plan projections or population levels near minimum viable populations of associated species.

Findings: The last detailed look at trends for these species occurred in 2001. The Regional office proposed a region wide analysis of bird and habitat data for FY 2005. Through about 1999, the amount of old-age (per plan, >80 years old cove, > 100 years upland) habitat increased on the forest. Beginning around 1999 and continuing into 2001, the amount of old age pine habitat decreased on the forest, a result of the large pine mortality following the southern pine beetle epidemic. However, pine habitat is seldom used by the pileated woodpecker. Through 2004, the amount of old age hardwood habitat continued to increase.

Through 2000, Kentucky regional data from the breeding bird survey indicate a relatively stable population of pileated woodpecker across Kentucky and the Cumberland Plateau. On the forest through 2000, breeding bird data indicate a relatively stable population. On the forest through 2000, point count data indicate a somewhat decreasing population of the species. Overall data from forest point count data through 2004 indicate a flucuating, but relatively stable population of pileated woodpeckers on the forest.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.b.6 Red-cockaded woodpecker MIS

Variability which would initiate future action: Significant reduction of active colonies or significant reduction of habitat below levels projected in the Forest Plan.

Findings: As a result of the unprecidented loss of southern yellow pine habitat due to the southern pine beetle outbreak, all known individual red-cockaded woodpeckers on the Forest were captured and transported to suitable habitat on other national forests in the Southern Region. During revision of the Forest Plan, the RCW wad dropped as a Management Indicator Species.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c Proposed, Endangered, Threatened, and Sensitive (PETS) Species - (The following important species were monitored in addition to Plan MIS monitoring requirements)

A.1.c.1 Bald eagle - Evaluate habitats for hacking capability.

Variability which would initiate future action: None.

Findings: Habitat evaluation for the purpose of determining hacking capability did not occur during FY 04. However, bald eagles did nest and produce young at two nest locations on the DBNF. Primary management zones were established at both nest sites.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c.2 Virginia big-eared bat

Variability which would initiate future action:
1) A significant population decline at the one large hibernaculum (as determined during the biennial winter census conducted in Jan/Feb of odd-numbered years).
2) Significant maternity season population declines, either at the summer bachelor colony or at two or more of the four known maternity colonies, during the reproductive season (as determined by annual emergence counts done with night vision equipment).
3) Damage to the cave gate that was constructed in 1993 to eliminate unauthorized human access to the cave that harbors the hibernaculum and large summer bachelor colony.
4) Damage, collapse, or blockage in the rear entrance of the hibernaculum (or to other connected caves in the area) which could alter air flow regimes and adversely affect cave microclimate.
5) Evidence of vandalism or human disturbance at any of the ungated summer maternity colonies; vandalism to warning signs which have been posted to discourage unauthorized human entry during the maternity season; eveidence of vehicular use of the blocked section of the abandoned road (blockades erected in 1994) which passes within 50 feet of the entrance of the Plecotus Pit maternity site.
6) Evidence of vandalism to the gate located at the mouth of Cave Hollow, or evidence that unauthorized OHV users are bypassing the gate or an adjacent boulder blockade to gain access into Cave Hollow.
7) The degradation, loss, or lack of importanct foraging and/or roosting habitat, including caves and rock shelters, clifflines, small grassy or weedy openings, small regeneration cuts, or ridgetop water holes.

Findings: Significant population declines for this species did not occur during either hibernation counts or maternity counts. No damage, either from natural causes nor from vandalism, occurred at any gated hibernation or maternity caves used by this species. There was no evidence of vandalism or human disturbance at ungated hibernation or maternity sites. The blocked abandonded road remaines unused by by OHVs. The quality and quantity of foraging and roosting habitat associated with this species remains stable on the DBNF.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c.3 Rafinesque's Big-eared Bat

Variability which would initiate future action: 1) Significant long-term population declines at one or more primary hibernacula during mid-winter (December-February) as determined during annual and/or biennial winter population censuses. A level of variability which would serve to initiate future action has yet to be determined. 2) Significant population declines at important summer maternity colony sites

during the reproductive season (June 14 to July 7) as determined by the use of night vision equipment for non-intrusive emergence count censusing. 3) Evidence of vandalism or human disturbance at significant summer or winter colony sites. 4) The degradation, loss, or lack of important foraging and/or roosting habitat, including caves and rock shelters, clifflines, small grassy or weedy openings, small regeneration cuts, or ridgetop water holes.

Findings: Significant population declines for this species did not occur during either hibernation counts or maternity counts. No damage, either from natural causes nor from vandalism, occurred at any known hibernation or maternity caves used by this species. The quality and quantity of foraging and roosting habitat associated with this species remains stable on the DBNF. Two mine portals on the London Ranger District that were known to be used by this species were gated to prevent human entry.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c.4 Indiana Bat

Variability which would initiate future action: 1) Meaningful long-term population declines at significant hibernacula (as determined during the biennial winter census conducted according to Recovery Plan guidelines).
2) Damage to cave gates on the Forest that have been constructed to limit unauthorized human access to caves that serve as significant Indiana bat hibernacula. 3) Damage, collapse, or blockage of cave entrances or passages which alters air flow regimes and negatively affect winter cave microclimate at significant hibernacula. 4) Evidence of vandalism or human disturbance at any of the significant ungated hibernacula, or vandalism to warning signs which have been posted to discourage unauthorized human entry during the hibernation season. 5) Declines in Indiana bat summer habitat suitability on the DBNF as defined by the Indiana Bat Summer Habitat Suitability Index Model (Romme er al, 1995).

Findings: Long-term population declines did not occur at DBNF significant hibernacula. Population trends remained relatively stable for the surveyed significant caves. No damage occurred to any of the gated caves on the DBNF. No significant hibernacula wer impacted by collapse or blockage of cave entrances. No vandalism was documented at any significant ungated cave or to any warning signs at entrances.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c.5 RCW Habitat (SHNS, Appendix D, p.3&4) – Evaluate the height of midstory within each active or recruitment RCW cluster site, annually.

Variability which would initiate future action: Midstory density exceeding 30% crown cover.

Findings: An intensive and extensive southern pine beetle outbreak resulted in the loss of most of the southern yellow pine on the DBNF. As a result of this loss of suitable habitat for the RCW, the remaining individuals were captured and moved to existing suitable habitat in Arkansas, South Carolina and Georgia. Therefore, there was no need to monitor midstory conditions for the RCW.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c.6 Additional PETS Species (Plants)

Variability which would initiate future action: The FLMP was developed with a sensitive plant list. Changes to the Forest list would initiate future action. Also, information which showed increases or decreases in numbers or threats to the species would initiate future action.

Findings: Two species of plants were added to the Forest's working PETS list in 2004. These were added not as a result of change on the forest, but rather new information regarding species present on the forest-- *Scutellaria arguta* (hairy skullcap) or recognition that a species on the forest was missed on an earlier list-- *Scopelophila cataractae* (Agoyan cataract moss). At least two white fringeless orchid sites showed signs of habitat deterioration—changes in water flow tied to weather and past disturbance.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

A.1.c.7 Additional PETS Species (Animals)

Variability which would initiate future action: The Forest Plan was developed with a sensitive animal list. Changes to the Forest list would initiate future action. Also, information which shows increases or decreases in numbers or threats to the species would initiate future action.

Findings: No changes were made to the PETS species list during FY 04. Other than noted above for the specific species, no substantial increases or decreases in numbers or threats were noted.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan and supporting documents (signed April 2004).

2. Forest Health (air quality, fire, insects & disease)

A.2.a Air Quality - Smoke Management

Variability which would initiate future action: Non-compliance with the Clean Air Act and State air standards. When ozone or particulate matter monitoring data for any area within or adjacent to the Forest is close to exceeding Clean Air Act or State ambient air quality standards.

Findings: Air quality monitoring is conducted by the Kentucky Division of Air Quality. Several pollutants are monitored, but the Forest is most interested in fine particulate (PM2.5) and ozone. Prescribed fire emissions contain fine particulate, as well as pollutants that contribute to ozone formation. None of the State's monitors are located on the Forest, however five PM2.5 and four ozone monitors are located within 50 kilometers of the Forest.

In 2004, EPA used the monitoring data to make the first nonattainment (NA) designations for the new fine particulate (PM2.5) and 8-hour ozone National Ambient Air Quality Standards (NAAQS). All monitors located within 50 kilometers of the Forest showed attainment of these standards. Of all monitors near the Forest, fine particulate concentrations are closest to the annual standard in Bell County (14 micrograms per cubic meter compared to the standard of 15 micrograms per cubic meter). All monitors in Kentucky are well below the 24-hour fine particulate NAAQS. And ozone is below the NAAQS at all monitors near the Forest.

Statewide, PM2.5 concentrations have been decreasing steadily since the first monitors began operating in 2000. Slightly coarser particulate matter (PM10), monitored since 1987, shows a downward trend as well. Ozone concentrations vary somewhat, but have also been steadily decreasing over the past 25 years.

Recommendations: Continue tracking air quality monitoring results.

A.2.b Air Quality - Resource Management - Monitor the effect of air pollutants on Wilderness and National Forest resources through chemical analysis of water, soil and plant tissue; injury surveys; and species diversity measurements.

Variability which would initiate future action: Degradation of resource condition as a result of air pollution.

Findings: Monitoring was conducted in the mid 1990s to assess the effects of air pollution, primarily acid deposition and ozone, on forest resources. Measurements were taken to determine the sensitivity of aquatic and terrestrial resources on the Forest to acid deposition, and assess the impact of ozone on vegetation.

Stream water chemistry and macroinvertebrates were measured over a period of three years in areas of the Forest considered most sensitive to acid deposition. Results indicated that even the most sensitive aquatic resources are well buffered and therefore unaffected by acid deposition. Stream acidification on the Forest is primarily a result of acid mine drainage, and not atmospheric deposition.

However, a 5-year soil chemistry study concluded in 1999, conducted jointly by the University of Kentucky and the Forest indicates that incipient stages of acidification could be occurring in the most sensitive (low buffering) soils on the Forest.

The state operates one acid rain monitoring site near the Forest, at Grayson Lake State Park. Results of almost 20 years of measurements show that the pH of rainwater has increased from about 4.2 to 4.6. This increase in pH coincides with sulfur dioxide emissions decreases at electrical generating plants in the region, and decreases in sulfur deposition at nearby National Atmospheric Deposition Program sites (http://nadp.sws.uiuc.edu/).

Surveys of sensitive plant species showed some level of ozone injury across the Forest. The severity of injury varied from year to year, as ozone exposures and moisture availability changed. The survey could not really address damage to vegetation (as expressed by growth loss) because there is not consistent relationship between visible injury and factors such as growth. In 2004, a paper was published that reported on ozone exposures and vegetation response in rural areas of the Central Appalachian Mountains, including eastern Kentucky. The authors found that although "ozone exposures often exceeded the NAAQS; this did not necessarily translate into prediction of substantive negative effects to forests, at least in the short term" (Edwards et al., 2004). With ozone concentrations steadily declining in Kentucky, this pollutant may not pose the same threat to the Forest that is once did.

EPA is in the process of regulating mercury emissions, primarily from coal-fired power generating facilities. As with any regulated pollutant, ambient monitoring is conducted. Mercury deposition is fairly new, and only one site exists in the state of Kentucky. The site located at Mammoth Cave National Park is part of the Mercury Deposition Network (MDN) (http://nadp.sws.uiuc.edu/mdn/), which operates through the National Atmospheric Deposition Program. There are no mercury monitoring sites on the Forest, but the MDN estimates between 12 and 16 micrograms per square meter (ug/m^2) in eastern Kentucky. This is fairly high deposition; exceeded only in Florida and the Gulf Coast states. The detrimental effect of mercury deposition on freshwater fish species is well known, and Kentucky has a statewide freshwater fish consumption advisory in effect.

Recommendations: Continue to report on air quality monitoring results from eastern Kentucky, particularly focusing on trends in acid deposition, ozone and mercury. Continued declines in acid deposition and ozone are expected, which is positive for aquatic and terrestrial resources. Mercury is an emerging issue that the Forest should track.

A.2.c Fire Management and Suppression - Ensure that the organization is adequate to provide cost-effecient suppression actions to support land management objectives while providing for personal safety. Evaluate the extent and effect of wildfire on National Forest System lands. Review fire reports for changes in patterns of fire occurrence, cause, acres burned, etc. Functional assistance trips and inspections on-the-ground are used.

Variability which would initiate future action: Suppression efforts to result in unacceptable resource damage, two consecutive years of increase in occurrences over 5-year average.

Findings: In 2004, the DBNF responded to 58 wildfires burning 1198 acres. Of the 58 wildfires, 77% were a result of arson. This a greater occurrence than 2003, however both years were well below the 5-year average (table A1)

Table A2c. DBNF Wildfires

Year	**# Fires**	# Acres
2000	125	**12,426**
2001	150	**15,814**
2002	61	**1,878**
2003	30	**233**
2004	**58**	**1,198**

Recommendations: A Fire Management Officer/After-Action Review of the fire season was completed with recommendations to consider additional law enforcement presence during fire season, and to utilize the Fire Prevention Teams.

A.2.d Fuel Treatment - Evaluate the extent and effects of prescribed fire. Review prescribed fire plans before and after burning, and conduct on-site inspections of prescribed fires during the burn and post-burn to evaluate burning conditions, smoke dispersal, and meeting of burn objectives.

Variability which would initiate future action: Objectives of prescribed fire are not being met.

Findings: During FY04 14,607 acres of hazardous fuels reduction burning was completed. Aerial ignition was used to expedite the burning process. The Forest Plan objective of 5,800 acres/year (LRMP p.IV-56) was exceeded by 8,807 acres. Burn Plans of Type 1 status were reviewed by the Forest Fire Staff to meet policy and direction. All standards and objectives were met within acceptable tolerance.

Recommendations: None. Objectives for a greater amount of burning have been incorporated into the revised Forest Plan.

A.2.e Insect and Disease - Determine extent of insect and disease activity. Assess effect of insect and disease occurrence on resources so that destructive insects and disease organisms do not increase to potentially damaging levels. Conduct aerial and ground surveys, and forest pest management biological evaluation.

Variability which would initiate future action: When insect populations or pathogens exceed levels deemed potentially damaging, based on forest pest management specialist judgement, and through Forest biological evaluation.

A.2.e.1 Gypsy Moth

Findings: Gypsy moth defoliation is likely to occur in Kentucky at some point in the future. In 1999, the USDA Forest Service, State partners, and other USDA agencies began using the Slow The Spread (STS) program along the 1,200 mile front which stretches from North Carolina to Wisconsin. With the STS in place, gypsy moth populations are estimated to enter the northeastern portion of Kentucky by the year 2025. Without STS, all of Kentucky would be expected to have gypsy moth infestation within a few years.

Intensive monitoring has occured to identify recently established, low-level populations in the transition area for possible treatment. Annual monitoring for gypsy moth is being done using pheromone traps located in high-use recreation and travel corridors. The state places pheromone traps on delimited grids (usually 16 per square mile) at random locations and around locations where moths have been trapped. Results of this monitoring for the Daniel Boone National Forest are shown in Table A2e. More information concerning this pest can be found on the web at: *http://www.fs.fed.us/ne/morgantown/4557/gmoth/* or at http://ceris.purdue.edu/napis/pests/egm/.

Direction has been incorporated into the revised Forest Plan for management that is designed to prepare oak-dominated stands for gypsy moth infestation.

Table A2e. Results of Gypsy Moth trapping on the Daniel Boone National Forest, FY-2004

District	Pheromone traps placed	Results of trapping (NO. and sex of gypsy moths captured)	Delimited grid trapping occurred (yes / no)	Results of delimited grid trapping (No. and sex of gypsy moths trapped)
Morehead	22	0 trapped	no	n/a
Stanton	12	0 trapped	no	n/a
London	37	0 trapped	no	n/a
Somerset	04	0 trapped	no	n/a
Stearns	06	0 trapped	no	n/a
Redbird	02	0 trapped	no	n/a

Recommendations: 1. Continue the monitoring program. 2. Consider beginning an environmental analysis for Gypsy Moth Slow-the-Spread treatments for the Forest. 3. Work with research scientists to set up local studies for advance oak regeneration and preparation of stands for future gypsy moth infestation.

A.2.e.2. Two-lined Chestnut Borer

Findings: This insect has been identified as doing damage to white oaks on the Morehead Ranger District in several stands. Since control is mainly a matter of preventing attacks through cultural practices that promote tree vigor, projects are being designed to thin stands and remove damaged trees.

Recommendations: Examine stands to determine the extent of damage being caused by this insect. Be on the lookout during stand exams to determine if this pest is occurring elsewhere on the Forest. Continue to work with Forest Health Protection (FHP) scientists for further assistance and guidance.

A.2.e.3. Southern Pine Beetle

Findings: Prior to FY 2004, this pest caused extensive and nearly complete mortality in stands having a component of 30+% southern yellow pine (shortleaf, pitch, loblolly, and Virginia pine). Approximately 5% of the 100,000 acres of stands previously classified as pine were inventoried in FY01 and FY02. No

specific pine stand inventory occurred in FY03 or FY04. Stands having a smaller component may or may not have sustained significant mortality. In several cases, mortality has occurred to eastern white pine. Additional mortality during FY04 was rare, since most pine was already dead.

Recommendations: No further action is needed to control this insect at this time. Continue to request funds for inventory of former pine stands, and monitoring of remaining pine stands.

A.2.e.4. Hemlock Wooly Adelgid

Findings: This insect was not found in Kentucky in FY04. There are no known cultural practices that can be done ahead of time to prepare hemlock stands for attack by this non-native invasive insect.

Recommendations: During compartment exams, sample hemlock stands for signs of this damaging insect. Focus inspections near roads and high-use areas. Consider preliminary preparation of environmental analysis for possible action such as biological control of this insect, should it invade the Forest.

3. Watershed Conditions

A.3.a Soil Survey Activities - Ensure the reliability of the survey by performing progress reviews and in the Management Attainment Report.

Variability which would initiate future action: Accuracy of mapping units is less than that prescribed for soil survey orders.

Findings: 1,719 acres of older soil mapping in Whitley County within the London Ranger District, was updated to modern soil survey standards through a cooperative partnership with the USDA Natural Resource Conservation Service (NRCS). Approximately 375,000 acres of older mapping has been modernized since the late 1980's; this leaves about 145,000 acres that needs to be updated.

Recommendations: Give priority to completing updates of older soil mapping on the Forest (145,000 acres need to be updated).

A.3.b Water Resource Inventory - Track inventory progress, evaluate quality/completeness of work and determine whether objectives are being achieved through program reviews and Management Attainment Report.

Variability which would initiate future action: Improper analysis or mapping.

Findings: In the early 1990's the Daniel Boone National Forest (DBNF) developed a stream inventory work plan and associated techniques manual (Walker and Bishop 1991) with four primary objectives: 1) test a stream inventory system to determine applicability to the DBNF and other National Forests in the Southern Region; 2) inventory habitat, fish, macroinvertebrates, channel stability, valley segment types, and riparian vegetation in two reference streams within each of the three major physiographic regions spanned by the DBNF; 3) Use information from the reference streams to classify other streams within each respective physiographic region by 1995; and 4) monitor the effects of timber harvesting and road building on stream channel stability, fish habitat, and riparian vegetation. Personnel from the DBNF inventoried numerous stream reaches using the stream inventory work plan between 1991 and 1994. The original intent was to repeat the inventories every 3-5 years to provide a measure of change in conditions at each site. However the DBNF was unable to repeat inventories at regular intervals due to budget constraints.

In 2004 the DBNF requested the assistance of the USDA Forest Service, Southern Research Station, Center for Aquatic Technology Transfer (CATT) with re-sampling of 18 of the original stream reaches

and six new reaches. The objectives of the 2004 inventories were to characterize existing stream habitat and fish populations, and where possible to compare results with data collected in the 1990's. Methods used to collect fish in 2004 were nearly identical to those used in the original inventory (Walker and Bishop 1991). Habitat methods used during both inventory periods were based on visual estimation of habitat attributes (Hankin and Reeves 1998), however in 2004 several of the original attributes were either modified or eliminated and new attributes were added to the inventory. Despite the changes, several similar habitat attributes can be compared between inventories. Here we present all habitat data collected during the 2004 inventories and comparable data collected during the original inventories. Fish data collected in 2004 were provided to the DBNF for analysis and will be presented in a future report. The full 1990's dataset is available through the DBNF.

Comparison of 2004 habitat inventories to data collected in the 1990's suggests that over the past decade inventoried reaches have trended away from channels with deep small surface area pools, towards channels with shallow large surface area glides. We found increases in the proportion of total surface area covered by slow water habitat units in 10 of 18 reaches and decreases in average pool depths and residual pool depths in all reaches. Loss of residual depth was greater than 30 cm in over half of all inventory reaches. While average pool depth is subject to change with fluctuating water levels, calculation of residual pool depth corrects for such fluctuations, thus changes in residual depths reflect actual changes in pool morphology. Furthermore, average riffle depth increased in over 50% of reaches and total wetted surface area increased for four streams with identical inventory lengths between years (War Fork, Rebel Trace, Tickey Fork, and Brierfield Branch 2) suggesting that water levels in the majority of streams were at or above levels encountered during the initial inventories.

One possible explanation for loss of pool depth is deposition of fine sediment in pools. We observed an increase in the prevalence of fine substrate particles as a proportion of total substrates in pools between the 1990's and 2004 inventories. In the 1990's half of the inventoried reaches had sand/silt as the most common subdominant substrate category in pools. By 2004, sand/silt became the dominant substrate category in half of the inventoried reaches. Riffles also trended towards smaller substrates with cobbles and gravels increasing in proportion at the expense of rubble and boulders as the most common dominant substrates, and with increases in gravels and sand/silt and decreases in rubble and boulder as the most common subdominant substrates. These trends are particularly disturbing considering that 4 of new inventory reaches contained sand/silt as the most common dominant substrate in pools with the 5th stream containing sand/silt as the most common subdominant substrate in riffles. Increase in fine sediment affects both the physical structure of streams and their ecology. As fine sediments increase pools fill and lose residual volume and riffles become embedded (Kappesser 2002). Such changes have been documented to have negative effects on many aquatic organisms including macroinvertebrates (Lemley 1982, Erman and Erman 1984), fish (Berkman and Rabeni 1987, Burkhead and Jelks 2001, Haro and Brusven 1994), amphibians (Corn and Bury 1989) and mussels (Box and Mossa 1999). Residual pools provide important refuges for fish, amphibians, especially in streams prone to annual drying. Other effects include loss of interstitial habitat, decreased reproductive success, decreased feeding efficiency, changes in predator-prey relationships and changes in community structure (Waters 1995).

Potential sources of fine sediment on the DBNF are numerous and include historic land use, off-highway vehicle (OHV) use, roads, and trails. Historically, many streams in Eastern Kentucky were straightened and channelized to provide for expanding agricultural fields. Channel straightening typically reduces pool volume and increases stream sedimentation (Knighton 1998). OHV use can also increase stream sedimentation (Riedel 2006) and was noted at several inventory sites. OHV use on National Forests has grown substantially over the past decade. The Chief of the Forest Service has cited unmanaged recreation, particularly OHV use as one of the four major threats to the health of National Forests. On the DBNF it appears that in some areas OHV traffic is overwhelming efforts to regulate use. Road and trail

maintenance, designation of use areas, closure of sensitive areas, user education, enforcement, and use monitoring should be the foundation of efforts to decrease effects of OHV use on DBNF streams.

The amount of LWD in streams can also have large influences on channel morphology and stream ecology. Woody debris plays a major role in creating habitat diversity for macroinvertebrates and fishes by forming of pools, retaining organic matter, and providing cover (Benke and Wallace 2003, Dolloff and Warren 2003). In 2004 we counted all pieces of LWD greater than 1 m long and 10 cm in diameter, whereas during the initial inventory only pieces greater than 3.6 m long and 30 cm in diameter were counted. Since smaller size classes typically comprise the majority of LWD we expected large increases in the total LWD in 2004. However, four streams showed decreases in LWD (War Fork, Hawk Creek Tributary, Bear Creek upper, and Katies Creek) and one stream (Rebel Trace) increased by only 1 piece per km.

LWD is recruited to streams by several mechanisms including mortality, blow down, fire, bank erosion, landslides and ice storms (Benda et al. 2003). Lack of recruitment could be related to the temporally and spatially sporadic nature of many of these mechanisms or to riparian and upland characteristics of each stream. Forest management can affect LWD recruitment by changing riparian and upland characteristics through activities such as timber harvest and road and trail construction.

Recommendations: OHV monitoring and enforcement efforts need to be increased. This is particularly true near stream channels with sensitive aquatic habitats.

LWD recruitment is one of the goals of the Riparian Prescription Area in the 2004 Forest Plan. FY04 results warrant a review of recent management activities in the stream reaches that were monitored, to determine if lack of LWD recruitment is related to management practices or simply to variability in natural processes contributing LWD to the stream channel.

A.3.c Soil Disturbing Activities - Determine if prescribed standards and guidelines, and mitigation measures are protecting soil productivity. Validate projected erosion rates and ``T'' factors for various management activities. Visual estimates and transects which monitor amounts and conditions of ground cover, nutrient status, soil bulk density. Use of special techniques will measure soil loss specifically related to individual management areas, soil mapping units, etc.

Variability which would initiate future action: Any deviation from Forest-wide standards and guidelines, and when actual erosion rates exceed projected erosion rates and ``T'' factors.

Findings: No documentation is available to demonstrate how successful the Forest may or may not have been in protecting long term soil productivity through implementation of best management practices or Forest Plan standards. No actual or predicted erosion rates were developed to validate "T" factors or confirm predictions made in the 1985 Forest Plan concerning tolerable soil loss rates for interpreting effects of various kinds of disturbances on soil properties and qualities important for future use and management.

Recommendations: The findings in this M&E report are addressed in the revised Forest Plan documents and supporting documents (signed April 2004). Monitor the soil resource as detailed in Appendix D in the revised Forest Plan.

A.3.d Soil and Water Resource Improvements - Determine if the applied techniques were effective; if the projected outputs were or are being obtained; and if maintenance is needed. Monitor through project reviews and Management Attainment Report.

Variability which would initiate future action: 30% vegetation failure of project area, stability problems which affect productivity or use and management, or does not achieve acceptable water qaulity standards.

Findings: Based upon field observations and water quality data, the conclusion is that the Forest has accomplished watershed improvement work on all but the more complex problem areas. Those complex projects that deal with acid mine drainage haven't achieved the level of performance desired. This has been due in part to both inadequate project design, but more importantly, a lack of funding to support project monitoring and maintenance. However, excellent work was accomplished in closing and remediation of damage to soil and water resources from illegal off-highway vehicle use. The Forest accomplished 120 acres, or about 83 percent of its projected annual average acreage objectives expressed in the Forest Plan.

Recommendations: Continue to seek funding and partnerships needed to address the inventory of acres and sites needing remediation of damage associated with past management on those lands acquired by the Forest through purchase and exchange (i.e. Abandoned and Inactive Mine Inventory). In addition, give priority emphasis to funding the development of monitoring and implementation plans for each watershed improvement project, including provisions for operation and maintenance.

A.3.e Water Quality Monitoring at Swimming Areas - Ensure that the water quality is suitable for water contact sport activities. Monitor with water samples collected at swimming areas. Follow E.P.A approved technique for analysis.

Variability which would initiate future action: Exceeding minimum S.S. water quality standards. Reference FSM 2532.5, Region-8 Supplement No. 42, dated 11/87.

Findings: In cooperation with the State Division of Water, eleven sites were regularly monitored at Laurel River Lake and three at Cave Run Lake for swimming water quality during 2002 and 2003. All 2002 and 2003 samples were in compliance. However, during 2004, the sampling was suspended due to State and Forest Service budget constraints.

Recommendations: Resume monitoring.

A.3.f Effects of Activities on Water Quality (Surface and Ground) and Riparian Areas - Determine if management practices on analysis areas and drainage basins are affecting water quality. Verify predicted water yield and sediment rates in relation to beneficial use of water. Monitor projects using above, below or paired watershed sampling techniques. Select areas having a high potential for adverse impacts such as soils developing from Pennington shale.

Variability which would initiate future action: Activities not meeting State and Federal water qualtiy standards or leading to possible long-term degradation of the watershed.

Findings: Results from past water quality monitoring has shown that a vast majority of streams on National Forest land are of the highest quality and land management activities are not significantly degrading water quality. Even though most of the streams on the Daniel Boone National Forest are of highest quality, there are still over 21 miles that are impacted by acid mine drainage from past coal mining activities and brine from old oil wells. Most of these streams are impacted from land use prior to Forest Service ownership, and do not meet state water quality standards or support aquatic life. Some of these streams were monitored in 2004. However, due to a limited monitoring budget the program was smaller than in past years. In 2004 a restoration project was complete in Rock Creek in cooperation with the State on the Stearns Ranger District in an effort to improve one stream that was impaired by coal mining. Initial results are promising but future monitoring will determine if this project was successful.

Recommendations: None

A.3.g Changes in Land Productivity - Identify any changes in land classified as productive, non-productive, or as sensitive soils. Monitor using vegetation inventories and resource data. This does not include acres that have been classified or allocated to non-forest uses.

Variability which would initiate future action: Any upward or downward changes in productivity or use limitations.

Findings: No changes have occurred in watershed condition class ratings.

Recommendations: None

A.3.h Trends for Water Quantity, Quality and Timing - Determine effect of plan on long-term trend for water quality, quantity and timing. Determined by specific sampling design, available data, and data to be collected. Monitor representative drainage basins wiht a mix of practices.

Variability which would initiate future action: Any downward trend or lack of progress in achieving stated goals and objectives.

Findings: Water quality standards are general being met (See Sections **A.3.a** and **A.3.c**). However, the exception is on severely disturbed mining areas and acid mine drainage problems on acquired lands. Funding for trend analysis is limited.

For the most part, research studies conducted by other federal and state agencies are being relied on for information on water yield and timing of flows (e.g. USGS, KY Geological Survey, and KY Division of Water).

Recommendations: None

B. Forest Resource Benefits

1. Outdoor Recreation Opportunities

B.1.a Developed Site Condition[1] - To ensure that facilities and the general areas of developed sites are maintained in a safe and sanitary condition in accordance with appropriate management levels. These conditions are monitored annually through on-site inspections.

Variability which would initiate future action: Deterioration rates higher than historic patterns at heavily developed sites.

Findings: The facility condition rating for most recreation buildings is good. Conditions of minor features such as picnic tables, grills and tent pads are average and do not represent a greater than historic deterioration rate. However, storms and lake action continue to deteriorate mooring sites and features at select sites such as Bee Rock Campground, and White Oak and Grove boat-in campgrounds.

Recommendations: Rehabilitate White Oak and Grove boat-in campgrounds and Bee Rock campground.

B.1.b Dispersed Area Use - To determine the actual use and ensure that the level of use is acceptable. This is monitored through the Recreation Visitor Day (RVD) reports, which consider trail and traffic counts, and field observations.

Variability which would initiate future action: 20% change in Recreation Opportunity Spectrum (REVIEW OF SYSTEMS:) carrying capacity per acre over a 3-year period.

[1] *Developed Site Use has not been recently monitored. The RIM system has not been used by the agency for several years, so Developed Site Use is no longer a monitored.*

Findings: RVD data is not available. The Forest completes a visitor use monitoring study on a five year rotation. Therefore forestwide data specifically for 2004 is not available. Field observations do not indicate a noticeable level of change across most of the Forest. However, use within specific areas such as the Red River Gorge, select riparian areas across the Forest and Cave Run Lake may be increasing.

Recommendations: Initiate Limits of Acceptable Change (LAC) process and inventory of impacted areas in the Red River Gorge. Initiate inventory of dispersed campsites within riparian areas. Initiate study to determine potential horse trail system at Cave Run lake. Assess sites at Jellico and Rock Creek to determine whether dispersed use should be eliminated or sites should be designated as dispersed campsites.

B.1.c Dispersed Area Condition - Identify problems and changing situations and conditions. Provide assistance in management of dispersed activities.

Variability which would initiate future action: When problem areas or situations are identified by an interdisciplinary team review or line officer.

Findings: Dispersed recreation continues to impact riparian areas and cultural resource sites in the Red River Gorge. Extensive horse use within the vicinity of Cave Run lake is degrading the condition of system trails and impacting other resources when illegal trails are created. As a result of the beetle outbreak in 2000-2002, many dead pines are still standing along trails or have fallen across trails especially on the southern portions of the Forest. Progress has been made in clearing and reducing hazard trees where they occur along trails.

Recommendations: Initiate LAC process and inventory of impacted areas in the Red River Gorge. Initiate inventory of dispersed campsites within riparian areas. Initiate study to determine potential horse trail system at Cave Run lake.

B.1.d Dispersed Area Conditions (OHV Amendment, Appendix E, p. E-3) – Annually, Check all designated OHV routes and associated structures for impacts to natural resources or possibly cause sedimentation in streams important to PETS species and their habitat.

Variability which would initiate future action: When problem areas or situations are identified by field checks that would take more than routine maintenance to correct.

Findings: Field inspections were completed on most designated trails. No specific problem areas were identified on designated OHV trails.

Recommendations: None

B.1.e Dispersed Area Condition (OHV Amendment, Appendix E, p. E-3) – Biannually check all archeological sites on or adjacent to designated OHV routes for impacts to cultural resource sites to ensure that no adverse direct or indirect impacts are occurring.

Variability which would initiate future action: When problem areas or situations are identified.

Findings: Field inspections were completed on 31 archaeological sites located on or adjacent to a designated user developed trail. County road improvements disturbed more than 90% of one site. Looting disturbed less than one percent of a rockshelter site, and less than 5% of an open prehistoric site was disturbed by OHV users riding around a mudhole. Approximately 30% of an open prehistoric site was impacted by the construction of a trailhead parking lot, and approximately 20% of another rockshelter site was disturbed. No evidence of new disturbance was observed at the other sixteen sites. Information is not available at this time for seven additional sites which may occur along a designated trail.

Recommendations: Continue site monitoring.

B.1.f Visual Quality Objectives (VQO) - Ensure compliance with visual quality objectives. Monitored by landscape architect involvement in proposed and actual projects.

Variability which would initiate future action: Failure to meet VQOs because of other resource priorities.

Findings: Data not available. Due to limited funding the Forest has not been able to hire a full-time landscape architect.

Recommendations: Develop scenery management standards for routine management actions and utilize off-forest Landscape Architects for non-routine projects that may affect areas with a visual quality objective of retention or partial modification.

B.1.f Visual Quality Objectives (VQO) - Ensure compliance with visual quality objectives. Monitored by landscape architect involvement in proposed and actual projects.

Variability which would initiate future action: Failure to meet VQOs because of other resource priorities.

Findings: Data not available. Due to limited funding the Forest has not been able to hire a full-time landscape architect.

Recommendations: Develop scenery management standards for routine management actions and utilize off-forest Landscape Architects for non-routine projects that may affect areas with a visual quality objective of retention or partial modification.

2. Roadless Areas/Wilderness/Wild & Scenic Rivers

B.2.a Wilderness Use - To ensure that use does not exceed the carrying capacity for the Beaver Creek and Clifty Wilderness areas. This is monitored through the RIM system, voluntary registration, and field observations.

Variability which would initiate future action: Use at 90% of the identified carrying capacity. At concentrated use sites, loss of 50% vegetative ground cover.

Findings: Data not available. Field observations indicate impacts are occurring in the Clifty Wilderness area.

Recommendations: Initiate LAC process and inventory of dispersed recreation in the Clifty Wilderness.

3. Heritage Resources

B.3.a Heritage Resources – Ensure compliance with the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), Archaeological Resource Protection Act (ARPA), and Forest Plan standards and guidelines. Strive to meet Forest Plan goals for inventoried acres and sites evaluated for National Register of Historic Places. Compliance is monitored by field and office reviews of project plans and implementation.

Variability which would initiate future action: Non-compliance with applicable regulations and Plan standards and guidelines.

Findings: *[The following is a summary of chapter five of the more detailed Heritage Monitoring Report submitted to the State Historic Preservation Office.]*

Despite the threat of severe penalties, looting and unintentional disturbance from dispersed recreation continue to be the most destructive agents for sites (particularly rockshelter sites) on the Forest.

Site monitoring on the Morehead District consisted of checking two sites along the White Sulfur Off-Highway Vehicle Trail. The sites are two charcoal kilns that were discovered during the survey for the trail. These sites are monitored annually and no impacts were observed in FY-03 or FY-04.

A total of 112 previously documented archaeological sites were visited during the monitoring project on the Stanton Ranger District in FY-2004. In addition, forty sites not previously monitored were monitored by the Heritage Resource Technician with an average of one visit each. The majority of the sites monitored during the FY-04 fiscal year had no noticeable evidence of dispersed recreation use. Forty of the sites monitored had evidence of continued recreational activities, such as camping, fire rings or climbing activity, and at some sites trash was left. Nearly all the sites monitored with recent camping activities are listed on the National Register and are impacted yearly by dispersed recreation activities. One site (15Mf383) exhibited some ATV use inside the rockshelter (ATVs bypassing gate at end of road to access this site – illegal ATV use area). Approximately twenty-six of the rockshelter sites had recently constructed fire rings that were dismantled by the backcountry rangers. The new fire rings at the sites are dismantled carefully and removed from the rockshelters, in order to not further impact the cultural deposits or encourage future use. Camping and campfires are prohibited in rockshelters in the Gorge, however enforcement is difficult. Many of the fire rings are a meter wide or less. The intense heat from these fires could cause considerable damage or completely destroy any cultural midden deposits or artifacts in close proximity to the hearth area. In addition, the charcoal from the modern campfires could mix with the cultural deposits and potentially cause problems for future radio carbon dating of the cultural deposits. Three of the fenced sites continue to be impacted, however the majority of the fenced sites are in good condition.

A total of twenty sites were monitored on the London Ranger District in FY04. A small amount of new disturbance was noted on two sites, one of which was the result of a trail mudhole. Trail maintenance conducted in the spring drained the mud hole and returned travel to the appropriate route.

Eight sites were monitored on the Somerset and Stearns Ranger Districts during FY-04. Five of these sites exhibited some recent looting or disturbance.

Two sites were monitored on the Redbird Ranger District during FY 04. The sites investigated included a rockshelter (15Ls122) known as Old Man Rock in Sugar Creek and the Peabody Site (15Cy295) located on the floodplain of the Red River.

Three sites on the Forest were impacted by Forest Service and county activities during FY04. These include the Peabody Site (15Cy295) on the Redbird District that was impacted by the construction of a parking lot and installation of a SST; 15Mf29, a site listed on the National Register that was impacted by the installation of several fenceposts to create a temporary holding area for the Gladie buffalo shortly before the arrival of a hurricane; and 15McY997 which was impacted by the county widening a FS road without Forest Service knowledge or permission. The Forest Supervisor, Recreation/Engineering/Lands Staff Officer, and Forest Archaeologist met with the Kentucky SHPO about these incidents in early FY05. It was determined that per our Programmatic Agreement with SHPO that the Forest will perform limited test excavations at site 15Mf29 to examine this site's National Register status and conduct a large-scale excavation at one subtitute site to mitigate the adverse impacts to sites 15Cy295, 15McY997, and a third site (Paragon – 15Ro21) that was revealed to have been impacted several years previously by the construction of a small camping area. Excavations at site 15Mf29 will take place during FY06, and the large-scale excavation is slated for FY07.

The Forest Archaeologist made a presentation to the Forest Leadership Team in FY05 about the National Historic Preservation Act and Section 106 and the differences / similarities / and interconnections with NEPA and the high cost in time and resources (and relations with the SHPO and tribes) of having to excavate sites (or substitute sites) because of our own negligence.

Recommendations: Continue to follow steps previously taken in the last several years including signing and fencing of archaeological sites. In addition, barrier fences have shown to work most of the time to halt dispersed recreation use at specific sites. Public education about site preservation and regulations, in both field and classroom contexts, is also an important technique that should continue. The new Gladie Cultural and Environmental Learning Center, which opened in June of 2004 contains numerous educational displays.

Law enforcement personnel on the Stanton Ranger District stated they had approximately 150 citation incidents for illegal camping in rockshelters during FY-04. Continue this strict enforcement.

4. Timber/ Silviculture

B.4.a Allowable Sale Quantity - Track the chargeable yields during the planning period. Only timber harvested on lands classified as "suitable for timber harvest" is chargeable against the Allowable Sale Quanitiy (ASQ). This is the estimated quantity that could be sustained indefinetly on such lands. Data is provided through the timber management information system (TMIS).

Variability which would initiate future action: Greater than 15% change from 5-year base harvest schedule. More than 10% of sales located outside of scheduled 10-year plan.

Findings: Utilization of wood products mainly occurred following unplanned events including a southern pine beetle outbreak, oak decline (twolined chestnut borer), and an ice storm at the northern end of the Forest. This removal was often necessary to protect the public and employees from hazard trees. The majority of timber harvested was on suitable forest, and was chargeable to ASQ. Less than 1% was not chargeable against ASQ (e.g. removal of hazard trees in recreation areas). The harvest schedule for planning period three (2000-2010) was projected to be 13 MMCF per year (table IV-2, 1985 LRMP). Actual harvest (cut) for FY04 was 0.5 MMCF, or only about 4% of the Plan's harvest schedule. One reason for this high variance was determined to be inaccurate yield tables that overestimated the land's capability for wood production. More reasonable estimates of ASQ and projected harvest amounts were made during the preparation of the revised Forest Plan.

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.b Regeneration Cutting by Management Area - Track the amount (acres) of regeneration and intermediate cutting by management area, chargeable/non-chargeable yields. The Forest Plan directs that this be determined every 5 years.

Variability which would initiate future action: More than 10% change.

Findings: A total of about 350 acres received a regeneration cut, and an additional 100 acres received a salvage harvest. Intermediate cutting (commercial thinning) occurred on 77 acres. Aproximately 35% of the harvest occurred on the Redbird Mangement Area; the rest occurred on the Cumberland Management Area.

Recommendations: NONE.

B.4.c Silvicultural Assumptions and Practices - Ensure that selection of forest/management type acres committed to regeneration are appropriate and that forest/management type, age class, and productivity

class are adheared to as shown in the Forest Plan and subsequent stand selections; suited and not-suited land is correctly identified; silviculture prescriptions follow management area standards and guidelines, and precede all vegetation manipulation; and all commercial and non-commercial thinnings are prescribed and carried out. Compliance is monitored through environmental analysis, associated NEPA documents, silvicultural prescriptions, and the CISC database.

Variability which would initiate future action: Greater than +/- 5% change. Silviculture program review questions validity of assumptions.

Findings: Due to the lack of regeneration harvest over the past 5 years, the Forest has not met the timber objectives ('85 LRMP, ch.IV-58-62), nor Plan standards and guidelines ('85 LRMP, p.IV-17, IV-122-123) pertaining to age-class distribution. In addition, the loss of most of the pine resource due to the SPB has precluded meeting forest type objectives. Minor changes in land suitibility are continuously updated in the Geographic Information System, as inventories are completed.

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.d Reforestation Practices and Assumptions - Ensure that planting densities and survival rate are in range established by FLMP standards and guidelines; regeneration is obtained within five years; regeneration objectives are met; and scheduled planting is accomplished. Use CISC, plantation survival reports, and certification and field checks to monitor.

Variability which would initiate future action: Less than 100% accomplishment of scheduled natural site preparation or planting in five years. Less than 80% of accomplishment per year.

Findings: For hardwood regeneration areas, sample cove and upland hardwood stands between 10 and 15 years of age were checked for eight years during the planning period. Tree dominance is apparent and a better evaluation of species composition can be made at this age. The results of this study show that abundant hardwood regeneration has occurred in these stands from natural sprouting and seed. The first year Survival exams of shortleaf pines planted in 2003, indicate that reforestation is occurring at adequate stocking levels (table B4). For the two stands planted in 2001, the third year stocking exams showed poor survival of planted pine, although natural pine regeneration brought the average pine stocking to above 50% of total stocking in these stands (table B4). Since less emphasis is placed on pure yellow pine stands and more emphasis placed on mixed pine/hardwood stands, a smaller component of pine is acceptable during reforestation (amend. 6, Aug.1990). The one stand (10 acres) that was planted with northern red oak in 2003, had poor survival and stocking and will be reexamined.

Table B4. First and Third Year Reforestation Checks

Restocking Standards **Trees per acre** (FLMP IV-21)		**Average Survival** **Planted trees per acre**		Average Stocking Total trees per acre	
Species Group	**Range**	**Planted 2003**	**Planted 2001**	**Planted 2003**	Planted 2001
Yellow pine	300 - 900	295	n/a	355	**n/a**
White pine	200 - 700	n/a	n/a	n/a	**n/a**
Hardwood	150 -1000	74	n/a	96	**n/a**
Pine/Hardwood	**300 - 900**	**352**	**173**	**598**	**591**

Recommendations: Continue to ensure adequate site preparation for, and release of, planted seedlings. The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.e Size and Spacing of Openings - Determine if such size limits (40 acres, LRMP p. IV-19) should be continued.

Variability which would initiate future action: Integrated resource management reviews identify lack of compliance with Forest Plan standard and guidleines for size and spacing of openings. Monitor through silviculture prescriptions, NEPA documents, and field checks.

Findings: This standard continues to be acceptable and has been carried into the revised Plan as per Regional guidance.

Recommendations: NONE.

B.4.f Conversion of Forest Types - Track planned conversions to ensure acreage is accomplished. Monitor through CISC.

Variability which would initiate future action: More than +/- 10% variation.

Findings: The extensive natural conversion of pine and pine-hardwood types to hardwood as a result of the Southern Pine beetle outbreak in 2000-2001, has precluded any chance to meet this objective. New objectives have been incorporated into the revised Plan.

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.g Existing and Regenerated Stand Yield Projections - Ensure that regenerated yield projections are correct by monitoring continuous forest inventory growth and yield data.

Variability which would initiate future action: No accomplishment within 10 years.

Findings: New yield projections have been developed for the revised Forest Plan.

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.h Timber Stand Improvements (TSI) and Assumptions - Ensure that scheduled TSI projects are accomplished which provide correct forest type objectives and density. Monitor through field checks, and CISC database.

Variability which would initiate future action: Less than 90% accomplishment of scheduled TSI in five years, or less than 80% accomplishment annually.

Findings: Timber Stand Improvement during FY04 occurred on 3035 acres. This included 1550 acres of pre-commercial thinning, 1163 acres of understory vegetation control (of which 391 acres was through prescribed burning), and 322 acres of seedling release. This accomplishment was 89% of the Plan objective of 3,400 acres for planning period 3 (p.IV-56).

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004). Continue to identify stands needing TSI during stand exams.

B.4.i Unregulated Volume Prepared for Sale - Ensure that unregulated volume follows projections by reviewing annual programmed sale quantity/TMIS, and silviculture prescriptions.

Variability which would initiate future action: +/- 100% change of projected unregulated volume harvested.

Findings: Timber volume is classified as unregulated when removed from lands classified as unsuitable for timber production. An example of such land would be a recreation area. Only 20 mcf of unregulated volume was harvested during FY04. This is significantly below 1985 Plan projections of 460 mcf per year (p.IV-58).

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.j Regeneration unit (SHNS, Appendix D, p. 2) – Annually, in one regeneration unit per district, at the end of site preparation for a unit, determine whether project implementation occurred as planned. Evaluate the number, size, and species of "leave trees". The same unit should be evaluated and reported at one, three, five and ten year intervals.

Variability which would initiate future action: Discrepancies between prescription and on-the-ground conditions.

Findings: Following the amendment, site preparation contracts have specified the new shelterwood leave-tree requirements. Contract inspection reports indicate that the number, size, and species of leave-trees has met prescription requirements. In FY04 the Morehead district has collected data following site preparation of three 2-aged stands. Data indicated that at least 20 square feet of basal area of adequate Indiana bat roost trees were available.

Recommendations: The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

B.4.k Two-aged harvest unit (SHNS, Appendix D, p. 2) – Annually, each district will evaluate the number, size, and species of "leave trees" occurring in a 5-year old two-age harvest unit. The same unit should be evaluated and reported at age ten.

Variability which would initiate future action: Discrepancies between prescription and on-the-ground conditions.

Findings: Following the amendment, timber sale contracts have specified the new shelterwood leave-tree requirements. Contract inspection reports indicate that the number, size, and species of leave-trees has met prescription requirements. No specific funding was available for specific data collection and analysis for this monitoring item.

Recommendations: Since the cumulative effect of both harvesting and site preparation (item B.4.j. above) give the resulting final condition of the stand, drop this intermediate monitoring item. The findings in this M&E report are addressed in the Revised Plan and supporting documents (signed April 2004).

5. Mineral Production

B.5.a Mineral Lease Applications - Determine objective attainment by the number of cases and the Management Attainment Report.

Variability which would initiate future action: None

Findings: **A** coal lease application (Gray Mountain Coal Lease) was completed on the Redbird Ranger District in FY 04. Oil and gas activities occurred only where mineral resources are privately owned, so no leases for federal minerals were processed this year.

Recommendations: None

B.5.b Mineral Evaluation Reports - Exchanges - Determine if direction is being followed by reviewing each exchange.

Variability which would initiate future action: 10% of cases not done.

Findings: No land exchange projects were accepted for FY04.

Recommendations: Continue to provide adequate mineral and geological input for these projects.

B.5.c Mitigation of Geological Projects on Sensitive Areas - Determine if direction is followed by assistance trips.

Variability which would initiate future action: Failure to follow recommendations 15% of the time.

Findings: This project category encompasses oil and gas operations on private and federal minerals. In FY04 the forest made several assistance trips for the support of oil and gas administration. The guidance offered to the operators was followed 90 – 95% of the time.

Recommendation: The only recommendation to improve this area is to become more consistent with the new forest plan guidance on riparian area management. The bulk of our mineral development is on the Redbird District where the topography can limit access to some areas. Also, there are many user-developed roads (some are public passageways) in the bottoms of drains, which give operators a sense that extending these roads to their project areas limits disturbance and is helping to meet our goals. We need to help operators get comfortable with our expectations regarding access to their sites.

B.5.d Timely Processing of Lease Applications - Determine if standard is met by review of cases.

Variability which would initiate future action: 15% of cases not meeting guide.

Findings: There are some projects such as the Pleasant Run Coal Lease on the Stearns District and the Chas I Coal Lease on the Redbird that have not been processed in a timely fashion. Initially the problem was the number of requests that came in while we were shorthanded with the staff trying to complete the Forest Plan Revision. The plan became the number one priority to get done for most all resource specialists.

Recommendation: Prioritize the remaining lease projects and work on completing them in a timely fashion next FY to catch up and be within the required timeframes.

B.5.e Adminstration of Leased Operations - Determine if adminstration of lease and operating plan is within compliance by assistance trips.

Variability which would initiate future action: Any operation with unsatisfactory compliance.

Findings: We have not processed any new leases for oil and gas in this FY, except the Gray Mountain Coal Lease, which has not gone through the State permitting process as of yet. So no new activity on leases has occurred. Inspection of existing activities is ongoing with some projects needing some modifications.

Recommendations: Continue the inspection of leased operations to monitor lease and operating plan compliance. Improve the timeliness of informing the operators of concerns such as road improvements, and minor site maintenance. Improve follow-up as needed.

B.5.f Administration of Reserved and Outstanding Rights - Determine if operations are adminstered in compliance with State, Federal, and operating plan.

Variability which would initiate future action: 10% of operations not in compliance.

Findings: Reserved and outstanding minerals have been the bulk of the minerals development on the forest. Inspections of new and existing development are conducted annually. Abandoned oil and gas activity areas that need improvement are on the districts that have limited staff to initiate remedies.

Recommendations: More timely input to the operators regarding problems we observe. SO Staff in minerals should look into the Abandoned Mined Lands funding from the RO/WO level to address some of the abandoned sites across the forest to provide a new avenue for addressing these problems.

6. Forage Production

B.6.a Administration of Grazing Allotments

Findings: The Daniel Boone National Forest no longer has any grazing allotments. Fences have been removed or are not being maintained.

Recommendations: No action.

7. Special Uses

B.7.1 Special Uses Adminstration - Determine if permit conditions are being met by assistance trips and inspections of permit areas for permit compliance.

Variability which would initiate future action: 10% of permits not in compliance.

Findings: The Forest was administering approximately 421 special use permits in FY2004, and had a target of 125 permit inspections for FY04. Only 26 of these inspections were accomplished. No report is available that shows how many of these permits are in compliance. However, it is believed that greater than 10% of permits are not administered to standard. Because of this, the Forest Supervisor has placed an emphasis on getting all special use permits administered to standard in the next 3 years. NFLM funds have been prioritized towards meeting this objective during FY05.

Recommendations: Continue to request higher funding levels to meet special use targets during FY05.

C. Infrastructure

1. Lands

C.1.a Property Line Location Maintenance - Determine if objectives and standards and guidelines are met by activity reviews and Management Attainment Reports.

Variability which would initiate future action: More than 10% of property lines not meeting standard (FSM 7153).

Findings: Considerably more than 10% of the Forest's property boundary lines are not meeting standard. Only 18 miles of the objective of 450 miles/year (LRMP, IV-72) was met. Even though a more realistic objective has been incorporated into the revised LRMP, the lands program has been significantly underfunded in the past, and the importance of keeping boundary lines maintained to standard has been under-emphasized during annual work planning.

Recommendations: Increase emphasis on property line maintenance and try to find increased funding to finance this activity.

C.1.b Property Line Establishment - Determine if objectives, and standards and guidelines are met by activity reviews and the Management Attainment Report.

Variability which would initiate future action: 10% of property lines not meeting standard.

Findings: See appendix D for changes in Land Ownership Status. Property lines are up to standard for the new property lines established through acquisition transactions. However, there are many property lines needing reestablishment due to obliteration that has occurred due to various reasons.

Recommendations: Request more funding for reestablishment of those property lines that have become indistinguishable for various reasons.

C.1.c Rights-of-way Acquisition - Determine if objectives are met by cases reported in the Management Attainment Report.

Variability which would initiate future action: 10% of cases not accomplished.

Findings: The 1985 LRMP objective was for 21 Right-of-Ways for period three. However, only 4 were planned in the program of work for FY04. Four road & one trail Right-of-Ways were accomplished as identified in the program of work. Since the level of Right-of-Way acquisition over the past several years has proved to be adequate, a more realistic objective was incorporated into the revised LRMP.

Recommendations: NONE.

C.1.d Landownership Adjustment - Exchange - Determine if objectives are met by the acres reported in the Management Attainment Report.

Variability which would initiate future action: None.

Findings: Land exchange proposals from private individuals or companies have mostly occurred where the recipient of National Forest System lands intends to mine coal. The objective for land exchange was 1000 acres/year (LRMP p.IV-56). Since a high level of funding became available for land purchace in FY04, land exchange became a low priority. No exchange activity occurred in FY-04. The objective for land exchange was reworded in the revised LRMP.

Recommendations: NONE.

C.1.e Landownership Adjustment - Purchase - Determine if objectives, and standards and guidelines are met by activity reviews and Management Attainment Report.

Variability which would initiate future action: None.

Findings: Reviews of land purchace program showed that objectives, standards and guidelines were being met. The Forest acquired 2533 acres through land purchace in FY2004. The objective for land purchace was only 300 acres/year (LRMP, p.IV-56). A more realistic objective was incorporated into the revised LRMP.

Recommendations: NONE.

2. Roads

C.2.f Local Road Obliteration (FLMP p. IV-44) - Ensure that unneeded roads are obliterated and returned to resource production by reviewing the Transportation Inventory System (TIS).

Variability which would initiate future action: Obliteration not accomplished within the required 10-year time frame.

Findings: Road obliteration continues to be a priority, with targets ranging from 1 to 3 miles each year. These targets are being met with an emphasis on process and implementation to assure that all potential affected resources are properly being considered and protected.

Recommendations: Emphasize obliteration of more Level 1 roads that are obsolete and grown in.

C.2.g Road Maintenance - Ensure that road maintenance estimates were correct, and protection of resources is adequate. Ensure that the amount of reconstruction is correct and accomplished as scheduled; that design standards are appropriate for management needs; and that estimated costs are correct. Review the Management Attainment Report, annual budgets, contracts and timber sale appraisals, and conduct field reviews for compliance.

Variability which would initiate future action: Average costs deviate from estimates by more than 25%. Road condition surveys show increase in maintenance needs ($) of more than 20% from previous year. Deviation of +/- 25% from planned mileage.

Findings: The Forest continues to meet the projected targets each year by utilizing maintenance contracts for surface grading, roadside brushing, culvert cleaning, roadside mowing, stone application, and miscellaneous road maintenance to insure that infrastructure investments and affected resources are being protected and public roads are safe. Through annual surveys, road conditions are being monitored and documented in the National INFRA database and then being used as planning tools for future work. Maintenance agreements with counties are in place to further enhance abilities to meet objectives. Stream crossings continue to be the greatest potential for impacts to aquatic species.

Recommendations: Accelerate planning and implementation of projects that harden stream crossings and utilize more bottomless structures to enhance fish passage.

C.2.h Collector Road Construction/Reconstruction - Ensure that the amount of reconstruction is correct and accomplished as scheduled, and that road design standards are appropriate for management needs. Review the Management Attainment Report for compliance.

Variability which would initiate future action: Deviation of +/- 25% from assigned targets.

Findings: The Forest adequately follows the appropriate design standards needed to meet requirements. Through annual road condition surveys, data is collected and analyzed for potential reconstruction projects, as well as, major road improvements such as widening, asphalt pavement and major stream crossings. Potential major projects are considered and submitted for Federal Highway construction/reconstruction funding.

Recommendations: Accelerate planning and seek out additional funding for larger scale stream crossings such as small bridges and bottomless culverts.

C.2.i Local Road Construction/Reconstruction - Ensure that the density and amount of local roads needed is correct and construction/reconstruction is accomplished as scheduled. Ensure that design standards are appropriate for management needs and that cost estimates are correct. Monitor through the Management Attainment Report, field reviews, and contracts and timber sale appraisals.

Variability which would initiate future action: Deviation of +/- 25% from assigned tartets.

Findings: The Forest adequately follows the appropriate design standards needed to meet requirements. Assigned targets are being met through adequate implementation. Field reviews continue to provide current information and use trends for management to determine construction/reconstruction needs for specific areas.

Recommendations: None.

D. Organizational Effectiveness

1. Accomplishment Summary

Table D.1 - Forest Plan Implementation Summary - Fiscal Year 2004
Daniel Boone National Forest

Management Attainment Report (MAR) Category & Code	Management Description	Unit of Measure	ANTICIPATED[1] LRMP annual average	FY-2004 Target	FY-2004 Accomplished
RECREATION					
RM-PAOTS-STD	Developed sites-ops & maint.	PAOT day	4,486,000	1,520,539	1,521,235
TL-MTC-STD	Trails maintained.	mile	322	205	205
TL-IMP-STD	Trails improved[2].	mile	12.5	6	6
HERITAGE					
	Surveys	acre	67,000		9,042
RM-HERT-EVAL	Site evaluation	each	5		0089
RM-HERT-INTP	Site interpreted	each			0
RM-HR-STD	Sites to standard	each			0
VEGETATION					
FM-VOL-SOLD	Timber sold	mcf	13,000	363.3	64.9
IM-ABV-PRJ	Silviculture exams	acre	66,413	52,000	40,518
VW-REF	Reforestation	acre	7,035	0	0
FM-REF-ALL	Reforestation	acre		0	0
FM-TSI-ALL	Timber stand imp	Acre		0	0
FM-FV-FM	Timber stand imp	acre	3400	860	3035
	Regen. MA 5:		145	0	0
WILDLIFE					
WL-STRUCTURE	Habitat structures	each	120	0	0
WL-IF-LAK-RE	Fish hab. imprv.	acre	30	33	70
WL-IF-STR-RE	Fish structures	each	10	31	13
WL-TES-STRUC	T&E structures	each	02		02
WL-TES-HAB	T&E hab. imprv.	acre	600	01	01
WL-THAB-RES	Habitat imprv.	acre	450	2,975	2,970
RANGE					
RG-GZ-ADM-ST	Grazing permitted	aum	100		0
RG-N-STR-IMP	Range non-struct.	each	50		0
RG-STRUC-IMP	Range structures	acre	2		0
SOIL, WATER & AIR					
SW-RES-IMP	Improvements	acre	144		0
	Improv. maint.	acre	495		0
MINERALS					
MG-BNE-OP-PR	Energy Operation	each	720		0
SPECIAL USES					
LM-SUP-	Special use adm	permits	n/a	125	26
LANDS					
LA-EXCH-	Land exchange	acre	2,056		0
LA-LND-PURCH	Land purchase	acre	300		2,533
LM-LL-NEW	Landline establish	mile	115		0
LM-BL-TOTAL	Landline maint.	mile	280		18
LM-ROW-ACQ	Right-of-way	cases	33		5
FIRE MANAGEMENT					
FP-FUELS-WUI	Fuel reduction	acre	5,830	8,477	15,607
FACILITIES					
RD-HIGH/PASS	Maintained	mile	1,144	557	557
RD-RAP-COMP	Constr./reconstr.	mile	92		0
RD-DECOMM	Roads Decommisioned	mile	n/a		0

1 Forest Plan, p. IV-55

2 Refers to "trail construction" in Forest Plan

2. Law Enforcement

D.2.a Law Enforcement - Evaluate effectiveness of law enforcement program. Incident reports, citations issued, trespass reports, fires reports are reviewed for effectiveness.

Variability which would initiate future action: Trends show increase in illegal activity indicating a need for shifts in enforcement effort. The Forest lost one full time position due to budget constraints and one reserve postion due to retirement.

Findings: Law enforcement activity has remained relatively constant over the last 3 years with a significant increase in alcohol and drug related offenses such as meth labs and dumps. These crimes are being detected in both developed and non developed areas aross the Forest. Strict enforcment of Title 36 CFR section 261 regulations applying to failure to pay recreation fees have sigificantly reduced the number of citations issued that are associated with the fee demonstration project.

Recommendations: Fill vacant LE position to maintain staffing levels.

Table D2a. Law Enforcement Activity on the DBNF			
	2002	**2003**	***2004***
# USFS Officers	9	9	*10*
# Citations Issued	2755	2714	*2389*
# Warnings Issued	*720*	*637*	*823*

Table D2b. Law Enforcement Problem Areas on the DBNF (# of Citations by Subject)			
	2002	**2003**	**2004**
Alcohol	143	222	356
Off-Highway Veh.	531	481	377
Timber tresspass	27	17	27
Drug offence	216	257	244
Cultural Resource damage	2	0	2
Vandalism	1725	1348	668
Arson	2	0	1
Other Illegal Activity	109	389	714

D.2.b Cooperative Law Enforcement - Evaluate effectiveness of cooperative law enforcement program by reviewing the Cooperative Law Enforcement Activity Report.

Variability which would initiate future action: Trends show increase in illegal activity indicating a need for shifts in enforcement effort. Budget cuts have reduced the total dollars available for cooperative agreements on the Daniel Boone by thirty-three percent. Shift timess and patrol areas for cooperators had to be renegotiated to ensure minimal coverage.

Findings: The Cooperative Law Enforcement Activity Report for FY 2005 discloses that the DBNF LE organization has worked effectively with Federal, State, and Local LE agencies during this period. Due to co-op funding shortage, one of the major cooperators decided not to participate.

Recommendations: Funding levels should be increased to provide adequate coverage and to allow for inflation. Continue to effectively cooperate with other law enforcement agencies to maintain a visible presence throughout the Forest.

3. New Issues

Several issues were identified in the Forest Plan revision process. Non-native invasive species (plants & animals) are continuing to become more of a threat to biodiversity. This and other evolving issues needed more emphasis in the Forest Plan, and were therefore addressed in the 2004 revision.

4. Ongoing Research & New Information

Many of our professional & technical personnel have maintained memberships in their respective professions, such as the Society of American Foresters, Wildlife Society, etc. Many employees have also maintained certification within and outside the Forest Service, for specific duties and responsibilities within their position. By staying active within such professional organizations, through personal contacts with peers at state society and chapter meetings our employees are more likely to be aware of new information and research. Through continuous contact with the Research and State & Private branches of the Forest Service, managers have been able to stay current with new information being assembled and published through credible scientific sources.

When new information is known and evaluated, we have often acted by initiating new pre- and post-disturbance monitoring of the ecosystem. We often approve specific research requests for research to be conducted here on the Forest by scientists at Forest Service Research Stations or various Universities. Many research needs were identified during revision of the Forest Plan (see Appendix C). The following are research projects that were continuing on the Forest in FY04:

Morehead / Stanton Districts

- Cerulian warbler research project – Patricia Hartman, Jeff Larkin - University of Kentucky
- Neotropical migrant bird use of burned areas – Cynthia Trombino, Morehead State University
- Pond-breeding salamander use of restored or constructed wetlands – Paul Nunley, Ohio St. Univ.
- Effects of fire on hardwood stands – Mary Arthur, University of Kentucky

London / Somerset / Stearns Districts

- Revegetation & Forest Succession of SPB-killed shortleaf stands in the southern Appalachian/ Cumberland Plateau region - Lynne K. Rieske-Kinney, University of Kentucky
- Effects of Stand Density upon growth, quality, and wood production in a young even-aged white oak stand (white oak stocking study) – Martin E. Dale / Dan Yaussy, USFS-NE Research Station

III. 2005 ACTION PLAN

[This section includes incomplete Actions from previous years.]

A. Actions NOT REQUIRING Forest Plan amendment or revision

FY05 Action 1: (see recommendation #A.2.e.1 Gypsy Moth)

1. Continue the gypsy moth monitoring program.

2. Consider beginning an Environmental Analysis for gypsy moth Slow-the-Spread treatments.

3. Work with research scientists to set up local studies for advance oak regeneration and preparation of stands for future gypsy moth infestation.

Responsibility: Forest Silviculturist / TWF Staff Officer

Projected Completion Date: FY2006 (item 1: ongoing)

FY04 Action 1: Establish [an appropriate number of] permanent plots to evaluate the reduction of fuels and changes to vegetation.

Responsibility: Fire Management Officer / Forest Silviculturist

Projected Completion Date: Fiscal year 2004.

Status FY04: Permanent plots have been established, however data still needs to be checked and input into the corporate database (FSveg).

FY04 Action 3: Rehabilitate White Oak and Grove boat-in campgrounds.

Responsibility: London District Ranger

Projected Completion Date: Initiate work in 2005. Complete when funding is available.

Status FY04: Funding not available to start work.

FY04 Action 4: Complete the Limits of Acceptable Change (LAC) analysis and implement applicable actions needed to protect resources.

Responsibility: Stanton District Ranger

Projected Completion Date: 2007

Status FY04: Initiated LAC process. Completed step 1: Identified issues and concerns.

FY04 Action 5: Accelerate work to harden stream crossings.

Responsibility: Engineering Staff Officer

Projected Completion Date: Ongoing

Status FY04: Crossings on the Renfro Loop trail were hardened in 2004. Other crossings are being hardened on an ongoing basis.

FY03 Action 4 &5: Seek increased target and funding allocations for landline maintenance & property line establishment.

Responsibility: Lands Staff Officer

Projected Completion Date: Fiscal year 2004

Status FY03: Targets and Funds were requested, but were not available. Continue action in FY04.

Status FY04: Targets and Funds were requested, but were not available. Continue action in FY05.

FY03 Action 6: Identify funding sources that could assist in reclaiming mine sites that are not found to contain hazardous materials. Continue to prepare to compete for the CERCLA funding to complete the reclamation. Within two years, inventory the number of acid mine drainage sites should be completed and needed work prioritized.

Responsibility: Lands Staff Officer

Projected Completion Date: Fiscal year 2004

Status FY03: The Kentucky Division of Abandoned Mine Lands has secured funds from various sources to restore lands and streams on National Forest System land affected by acid mine drainage. The forest is receiving CERCLA money for analysis, planning, design, and eventually reclamation of acid mine drainage sites. The Forest is completing an inventory of abandoned mine land features including AMD sites. Eventually funding will be requested for restoration of abandoned mine lands.

Status FY04: Not reported.

FY03 Action 7: Seek additional funding for administering special use permits, to bring all permits to standard.

Responsibility: Lands Staff Officer

Projected Completion Date: FY 2007

Status FY03: Additional funding was requested for administration of special use permits. Funding was not available. Continue such requests in FY04.

Status FY04: Funding was not adequate to accomplish the assigned target. NFLM funds have been prioritized towards meeting this objective during FY05. Continue to request higher funding levels to meet targets during FY05.

B. Actions REQUIRING amendment or revision to the Forest Plan: *NONE*

C. Amendments or revision to be completed

FY04 Action 7: Revise the Land & Resource Management Plan

Status FY04: The Forest Plan was revised and a Record of Decision issued on April 16, 2004. Notice of Availability (NOA) of the Final Environmental Impact Statement appeared in the Federal Register on April 23, 2004. Direction in the revised Forest Plan became effective 30 days later on May 24, 2005. The administrative appeal period (36 CFR 217) ended on July 23, 2004. Two appeals were received. One filed on behalf of Kentucky Heartwood, Heartwood, Cumberland Chapter of the Sierra Club, Wild South, and Wildlaw; the second appeal was filed on behalf of The Kentucky Forest Industries Association, East Kentucky Chapter of the Society of American foresters, Daniel Boone Forest Alliance, and Southern Appalachian Multiple Use Council. On 12th of November 2004, the Daniel Boone National Forest forwarded the appeal record to the Regional Forester. Review of the appeal issues is underway at the USDA Forest Service Washington Office. A decision on the appeals is pending by the Chief, USDA Forest Service.

D. Recommendations where No Action will be taken in FY 2005.

FY03 Recommendation: Consider delisting of the white-haired goldenrod, *Solidago albopilosa* (federal Threatened).

Status FY03: The FWRP staff visited several white-hared goldenrod sites in conjunction with the Kentucky State Nature Preserves Commiossion (KSNPC), the U.S. Fish and Wildlife Service (USFWS), and Stanton Ranger District staff. During this visit, Forest Service efforts to work with the public in the protection of the species were reviewed. Cooperative monitoring efforts (KSNPC and Forest Service) were discussed. Efforts were considered positive and provided good information. A discussion at several sites led to an agreement by the USFWS to help define terms such as population and occurrence in the light of recovery goals. The meeting also confirmed that further discussion of de-listing of the species over the next planning period was warranted. Discussions were ongoing. Goals and objectives for de-listing of the WHGR are expected with the release of the ROD for the revised Forest Plan.

Status FY04: Further discussions occurred in 2003 and 2004 and language showing recovery of white-haired goldenrod as an objective was included in the new plan signed April 2004. Discussions for delisting will continue in FY05.

IV. APPENDICES

Appendix A. Forest Plan amendments (September 1985 – April 2004)

Amendment No.	Date	Responsible Official	Amendment Description
1	04-06-87	Chief, Robertson	EIS/ROD Suppression of southern Pine Beetle
2	01-21-88	Forest Supervisor, Wengert	Updated implementation schedules for trail construction, timber sales, studies of rivers, Cave Run Lake botanical area.
3	07-27-89	Regional Forester, Alcock	Incorporation of methods and tools for use in the FEIS on Vegetation Management in the Appalachian Mountains
4	03-27-89	Regional Forester	Cutting policy within 3/4 mile of RCW colonies on existing timber sale contracts
5	May 1990	Regional Forester	Interim Standards and Guidelines for the Protection and Management of RCW Habitat within 3/4 mile of colony sites.
6	07-09-90	Forest Supervisor, Wengert	Direction for management of mixed types (pine-hardwood or hardwood-pine)
7	12-20-90	Forest Supervisor, Wengert	Changes to Standards and Guidelines for soil and water.
8	06-21-95	Regional Forester, Joslin	Designation of tentative HMA for suitable RCW habitat
9	06-19-95	Forest Supervisor, Powell	Removal of Two Gauging Stations from within the Beaver Creek Wilderness Area
10	04-24-98	Forest Supervisor, Worthington	OHV Management Direction
11	7-28-00	Forest Supervisor Worthington	Special Habitat Needs and Silviculture (SHNS)
12	10-02-02	Forest Supervisor Worthington	Swift Camp Wilderness Restoration and Watershed Improvement
13	10-26-02	Regional Forester, Joslin	Supplement to the Final Environmental Impact Statement Vegetation management in the Appalachian Mountains
14	10-31-02	Forest Supervisor Worthington	The Redbird Crest Trail Relocation

Appendix B. Completed Actions from Previous M&E Action Plans

Actions NOT REQUIRING Forest Plan amendment or revision

FY03 Action 1: Retain Eastern towhee as a MIS in the Forest Plan revision..

Responsibility: Forest Biologist

Projected Completion Date: Fiscal year 2003

Status FY03: The Eastern towhee was retained as a MIS during FY 02. Breeding bird surveys were conducted during FY 02. Analysis of this data was not completed. Retention of this bird as an MIS is expected in the Plan revision.

Status FY04: The revised forest plan signed in April 2004 retained the eastern towhee as an MIS species. The Regional office is analyzing regionwide bird data from the R8 Bird point survey. This analysis is expected to continue into FY06. **ACTION COMPLETE**

FY03 Action 2: Evaluate the Forest's susceptibility to gypsy moth attack. Take action to increase advance regeneration, especially oaks.

Responsibility: Forest Silviculturist

Projected Completion Date: Prior to Fiscal year 2003

Status FY03: This evaluation has been done as a part of the Forest Plan Revision, but is still in Draft form.

Status FY04: This evaluation is available in the Final EIS for the revised Forest Plan. Silviculturists are planning actions that are recommended to increase advanced oak regeneration. **ACTION COMPLETE**

FY03 Action 3: Continue to monitor areas near sites of known species at risk. Continue to improve existing designated trails and to close user-developed trails as appropriate for the protection of species at risk. Initiate seasonal closures on trails not capable of handling year-round traffic. Restrict all trail uses, except hiking, to existing routes that were constructed for that type of use.

Responsibility: Forest Threatened and Endangered Species Biologist

Projected Completion Date: Prior to Fiscal year 2003

Status FY03: New standards, goals, and objectives are expected with the release of the Record of Decision for the revised Forest Plan.

Status FY04: Monitoring requirements for species at risk have been incorporated in the revised Forest Plan (monitoring elements 31 and 40 and Goals 1 and 12). **ACTION COMPLETE**.

FY04 Action 2: Gypsy moth defoliation is likely to occur in Kentucky at some point in the future. Management activities should prepare oak-dominated stands for gypsy moth presence. In older stands, activities should encourage development of advanced oak regeneration to replace over-story trees as they become defoliated and die. In younger stands, activities should provide for vigorous growing trees. Trees should have plenty of room to develop root and crown growth. In recreation areas, activities should encourage vigorous growing trees.

Two-lined chestnut borer activity is expected to continue. Efforts to detect and suppress two-lined chestnut borer activity should continue. Other activities that improve tree vigor are encouraged.

Responsibility: District Rangers – Project identification and implementation.

Projected Completion Date: Ongoing

Status FY04: Such direction has been incorporated into the revised Forest Plan. **ACTION COMPLETE**.

Actions REQUIRING Forest Plan amendment or revision

FY03 Action 8: During revision of the Forest Plan, drop the red-cockaded woodpecker as a Management Indicator Species.

Responsibility: Forest Biologist

Status FY03: The Forest Plan revision is expected to be complete during FY 2004.

Status FY04: The red-cockaded woodpecker was dropped as a MIS. **ACTION COMPLETE**

FY03 Action 9: During revision of the Forest Plan, ensure that appropriate protection of heritage resources occur, particularly within the Red River Gorge Geological Area.

Status FY03: Expected to be accomplished with release of the Record of Decision for the Revised Forest Plan.

Status FY04: This issue was addressed in the Plan revision, and Standards were included to protect and enhance heritage resources. **ACTION COMPLETE**

FY03 Action 10: As suggested in the 1991 5th Year Review Report, a better group of aquatic MIS would be macro-invertebrates. MIS species will be addressed in the revision of the Daniel Boone's Forest Plan. As part of this, consideration should be given to the macro-invertebrate group. These species are much less mobile than fish and population trends could be related to long-term land management activities. Analysis would require a more rigorous sampling system than now exists on the DBNF.

Status FY03: This action is expected to be accomplished with the release of the Record of Decision for the revised Forest Plan.

Status FY04: Macro-invertebrates were incorporated in the revised Forest Plan as monitoring task number 17. Fish were dropped as MIS. **ACTION COMPLETE**

FY03 Action 11: Eastern Bluebird—Cause and effect relationships between population trends and national forest management are difficult to establish. When DBNF MIS are addressed as part of the Forest Plan revision, it is recommended that this species be dropped.

Status FY03: This is expected to be accomplished with the release of the Record of Decision for the revised Forest Plan.

Status FY04: The revised Forest Plan signed in April 2004 did not include eastern bluebird as a MIS. **ACTION COMPLETE**

Appendix C. Summary of Research Needs

[The following items are also listed in Appendix E of the Revised Forest Plan (April 2004).]

1. Determine whether the cliffline prescription area is appropriate to maintain desired microclimate and hydrologic conditions.
2. Earlier work with white-haired goldenrod indicated that the species might be suffering from genetic depression. Work to determine genetic changes following controlled crosses is needed to see if such crosses would benefit the species without genetic loss.
3. Vegetation response to regular prescribed fire is needed to help managers make better decisions for actions on the ground.
4. The response and potential control or encouragement of invasive exotic weeds following increased use of prescribed burning is needed.
5. Determine the effect of forest overstory management and prescribed burning on the incidence of use of treated areas by Indiana bats.
6. Determine regional relationships between stream discharge, basin drainage area and stream channel geometry in the Licking and Kentucky basins.
7. Determine historical pre-European distribution of yellow pine forest types on the escarpment.
8. Determine forest community change throughout the Holocene.
9. Determine the distribution of various age classes and vegetative types and determine which age classes or vegetative types may be lacking but needed for certain bird life history requirements.
10. Develop treatments to protect forest from devastating introduced insects and diseases, particularly gypsy moth and hemlock wooly adelgid.
11. Determine rates of nest predation and parasitism by the brown-headed cowbird in various habitats and management regimes.
12. Determine how best to use fire to regenerate and initiate stands of oak-pine and pine-oak.
13. Determine how best to regenerate and maintain uneven-age (multi-age) stands of various native forest types.
14. Determine seasonal movement of blackside dace.
15. Determine the life history of duskytail darter.
16. Determine minimum viability of all species on the forest.
17. Determine the life history of PETS mussel species
18. Determine the feasibility of artificial reproduction of the mussels specifically Pegias, Villosa, and Alasmodonta.
19. Determine the effects of sediment and sedimentation on aquatic insects, fish and mussels.
20. Determine the effects of soil compaction and trampling on archeological deposits in rock shelters.

Appendix D. Daniel Boone National Forest Land Ownership Status

Table D.1. – Daniel Boone National Forest System Lands, Fiscal Year 2004

County	Morehead	Stanton	London	Somerset	Stearns	Redbird	Total
Bath	19,386						**19,386**
Clay						78,078	**78,078**
Estill		2,265	3,333				**5,598**
Harlan						803	**803**
Jackson			58,780				**58,780**
Knox						74	**74**
Laurel			63,647				**63,647**
Lee		5,822	2,765				**8,587**
Leslie						52,142	**52,142**
McCreary				41,485	101,181		**142,666**
Menifee	24,428	22,372					**46,800**
Morgan	13,030						**13,030**
Owsley			3,848			12,586	**16,434**
Perry						2,151	**2,151**
Powell		15,528					**15,528**
Pulaski			109	38,186			**38,295**
Rockcastle			16,364				**16,364**
Rowan	62,543						**62,543**
Wayne					642		**642**
Whitley			34,018		12,500		**46,518**
Wolfe		16,563					**16,563**
Total	**119,387**	**62,550**	**182,864**	**79,671**	**114,323**	**145,834**	**704,629**

Table D.2. –Daniel Boone National Forest System Lands, Fiscal Year 2003

County	Morehead	Stanton	London	Somerset	Stearns	Redbird	Total
Bath	19,300						**19,300**
Clay						78,078	**78,078**
Estill		2,265	3,333				**5,598**
Harlan						803	**803**
Jackson			58,507				**58,507**
Knox						74	**74**
Laurel			63,484				**63,484**
Lee		5,822	2,765				**8,587**
Leslie						52,142	**52,142**
McCreary				41,057	101,172		**142,229**
Menifee	24,356	22,372					**46,728**
Morgan	13,030						**13,030**
Owsley			3,848			12,586	**16,434**
Perry						2,151	**2,151**
Powell		15,528					**15,528**
Pulaski			109	37,687			**37,796**
Rockcastle			15,850				**15,850**
Rowan	62,509						**62,509**
Wayne					642		**642**
Whitley			33,497		12,500		**45,997**
Wolfe		16,563					**16,563**
Total	**119,195**	**62,550**	**181,393**	**78,744**	**114,314**	**145,834**	**702,030**

Appendix E. List of Preparers

Amos Stone – Silviculturist (principle editor)

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Gene Baker - Engineer

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